



United States Department of the Interior
FISH AND WILDLIFE SERVICE

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MAR 18 1992

Memorandum

To: All Interested Parties

From: ^{Acting} Regional Director, Fish and Wildlife Service
Region 1, Portland, Oregon

Subject: Protocol for Surveying Proposed Management Activities that May
Impact Northern Spotted Ovs

Attached is the revised prococol for surveying proposed **management** activities **that** nay **impact** northern spotted ovls. This protocol vas originally developed in 1991 to **assist** all land managers in surveying spotted owl habitat around planning or **management activity** areas. Based on feedback from chose who utilized the survey prococol in 1991, the Fish and Wildlife Service (Service) has incorporated additional **clarification** into the protocol to make **it** more complete and understandable.

Questions concerning the prococol should be addressed to the appropriate Service Field office.

In Cregon, Portland Field Office (FTS 429-6179 or 503-231-6179)
In Washington, Olympia Field Office (FTS 434-9440 or 206-753-3440)
In California, Sacramento Field Office (FTS 460-4866 or 916-978-4866)

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Attachments

**PROTOCOL FOR SURVEYING
PROPOSED MANAGEMENT ACTIVITIES
THAT MAY IMPACT NORTHERN
SPOTTED OWLS**

**Endorsed by the
U.S. Fish and Wildlife Service**

7 March 1991

REVISED - March 17, 1992

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**FWS ENHANCEMENT
SACRAMENTO FIELD OFFICE**

PROTOCOL FOR SURVEYING PROPOSED MANAGEMENT ACTIVITIES THAT MAY **IMPACT NORTHERN SPOTTED OWLS**

INTRODUCTION

The **enclosed** protocol was designed for surveying areas where Federal or non-Federal activities may remove or **modify** northern **spotted owl habitat**. The U.S. Fish and Wildlife Service (**Service**) endorses the use of this protocol for gathering information on spotted owl **occupancy** in proposed project areas for assessing **affects** of the **proposed** actions. Note that any information on owl presence within and/or adjacent to the proposed planning or **activity** areas is important, even if it does not **meet** the guidelines described below. However, if the only **information** available for a particular activity was acquired through less intensive surveys, the Service must conservatively **assess** (i.e. a **worst-case** analysis) the **impacts** of the action on northern spotted owls. It is always useful to document reasons for not adhering to the recommended protocol.

This **protocol** is based on several **existing** protocols and, when implemented, **should serve** two primary purposes: (1) provide adequate coverage and **assessment** of the area for the presence of spotted owls, and (2) ensure a high **probability** of locating **resident spotted owls** and **identifying** owl territories that may be affected by a proposed management **activity**, thereby minimizing the potential for **unauthorized incidental take**. It is not appropriate to use **this** protocol to **monitor** yearly **trends** of sported owls or for many other research **applications**.

In **this** document, management **activities** are defined as those **activities** which may impact northern spotted owls. The most **common activity** is **harvest** or modification of **spotted owl habitat**. Also **included** under management **activities** are various types of **disturbance** not necessarily associated with **timber harvest** activities.

This **protocol** was peer-reviewed by **scientists**, biologists, and managers who work on various **issues** **pertinent** to the ecology and **management** of northern spotted owls. Reviewers included personnel from:

- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Bureau of Land Management
- Humboldt State University
- Oregon State University
- California Department of Fish and Game
- Oregon Department of Fish and Wildlife
- Washington Department of Wildlife
- National Council of the Paper Industry for Air and Stream Improvement
- Timber Association of California
- Private Timber Companies
- Private Consultants

APPLICATION OF THE NORTHERN SPOTTED OWL SURVEY PROTOCOL

SURVEY AREA

- o To ~~the~~ maximum ~~extent~~ possible, all spotted owl habitat ~~within the~~ specified provincial radius from ~~the~~ perimeter of the proposed **activity** area should be surveyed. The provincial radii are **as** follows:

Washington Cascades	= 1.8 miles
Olympic Peninsula	= 2.2 miles
Oregon Cascades	= 1.2 miles
Oregon Coast Ranges	= 1.5 miles
Klamath Rovince	= 1.3 miles

DURATION OF SURVEYS

Previous survey data were analyzed to determine ~~the number of visits needed to result~~ in a high likelihood that ~~territorial~~ owls will be detected or ~~that~~ a lack of owl responses accurately reflects an absence of spotted ~~owls~~. Preliminary analysis of ~~the~~ data provided the basis for ~~determining the~~ number of visits per year for both the 2-year and ~~1-year~~ surveys. Two-ye surveys provide more accurate results for an area ~~because of the intermittent~~ occupancy of spotted owls ~~within~~ particular areas. These ~~2-year surveys~~ are more likely than 1-year surveys to accurately document ~~the~~ presence of owls or territories in these situations. Use ~~the~~ following instructions for surveys ~~during~~ 1392.

- o 1-year (**6-visit**) surveys ~~are~~ acceptable, However, 1-year surveys provide a somewhat lower likelihood of ~~determining the presence~~ or absence of spotted owls. In addition, 1-year surveys will be valid only until the beginning of the following breeding season.
- o 2-year (**3 visits/year**) surveys are preferable for surveying a management **activity** or planning **area** to determine ~~the~~ presence or absence of spotted owls. Surveys may be completed sooner if a response is **obtained** and status of the owl(s) is **confirmed**. However, we recommend ~~that~~ every effort be made to determine the highest status for a **given** site. **2-year** surveys may be valid for 2 additional years.
- o 2-year surveys are encouraged to provide a higher likelihood of accurately determining presence or absence of spotted owls. They may also be more **economical**, especially in cases where **harvest** will occur in more ~~than~~ one year.

In this document, a complete survey is defined as coverage of ~~the~~ survey area to the required **number** of **visits** and an overall inventory ~~that~~ meew the protocol guidelines.

- o If a 2-year survey is **completed** (**3 visits/year protocol**), using the Service's survey protocol, and no responses are obtained, the negative **results** may be considered **accurate** for 2 additional years without **conducting** additional surveys.

Example: 2-year survey

Year 1 (March - Sept.)	3 visits with no response
Year 2 (March - Sept.)	3 visits with no response
Year 3	Harvest without additional surveys
Year 4	Harvest without additional surveys
Year 5	Suspend activities and resurvey the area during the breeding season if harvest is not completed before the start of the breeding season in Year 5

- o If a 1-year survey is completed (6 visits), using the Service's survey protocol, and no responses are obtained, harvest could occur before the start of the next breeding season. If harvest is not completed within this time period, a 3-visit minimum survey would be needed prior to harvest in the second year. This is equivalent to 1 year of a 2-year survey- If harvest was not going to occur until after year 2, and the 3 visits in year 2 produced no responses, the negative results may apply for 2 more years without having to conduct additional surveys.

Example: 1-year survey.

Year 1 (March - Sept.)	6 visits with no responses
Year 2	Conduct 3 more visits as described below if harvest is not completed before the beginning of the breeding season. The 3 visits should be conducted prior to harvest. If no responses obtained, additional surveys not needed for 2 more years.
Year 3	Harvest without additional surveys
Year 4	Harvest without additional surveys
Year 5	Suspend activities and resurvey the area during the breeding season if harvest is not completed before the start of the breeding season in Year 5

- o If a nest site or activity center is located by a 1- or 2-year survey, and if harvest will take place in the area in years following the initial surveys, further surveys may be necessary, as follows:

If an owl site is located during a 1-year survey, and the project area is large enough to possibly support more than one site, remaining potential sites should be surveyed three times in the second year. Also, unless otherwise authorized under an incidental take statement or permit from the Service, the original nest site or activity center should be surveyed for occupancy in the year of the action. It is not unusual for owls to change their nesting location from year to year. If the owls are not at the original location, all areas inside harvest units and within 0.25 mile of harvest unit should be surveyed each year of harvest according to a 3-visit protocol to eliminate the chances of disturbance to spotted owls during the breeding season.

OVERLAP OF NEW AREAS WITH AREAS SURVEYED IN THE PREVIOUS YEAR

- o In cases where a survey area overlaps all or part of a previous year's survey area, a minimum of 3 visits should be completed for those areas covered by the previous year's surveys, and the new areas should be surveyed with either the 1-year or 2-year protocol (see DURATION OF SURVEYS).

DETERMINING UNOCCUPIED STATUS OF AN HISTORICALLY OCCUPIED SITE

- o If no responses have been obtained from an historical site after 3 years of survey (using the guidelines established in this document), the site may be considered unoccupied, barring other evidence to the contrary.

NORTHERN SPOTTED OWL SURVEY PROTOCOL

HABITAT TO BE SURVEYED

For purposes of surveying, spotted owl habitat is any habitat where you may expect to elicit a response from a resident owl or pair of owls. Descriptions of spotted owl habitat for the various areas and physiographic provinces should be available from the various state wildlife and forestry agencies-

COORDINATION OF INFORMATION

The importance of coordination in conducting spotted owl surveys cannot be overemphasized. Appropriate coordination involves: 1) pre-season planning (including coordination of commitments by adjacent landowners on the areas to be surveyed by each party); 2) immediate communication of results, positive or negative, that may affect other landowners; and 3) exchange of post-calling season information summaries. Common mistakes, such as overlapping visits by more than one survey group, can be avoided through coordinated pre-planning. It is also advisable to inform adjacent landowners of all surveys near their ownership because new survey results may affect their management and logging operations.

The state agency or spotted owl database holder responsible for evaluating forest practice applications and analyzing survey data should be kept up to date with new survey results.

SURVEY PERIOD

- o All surveys of proposed management activity areas must take place between 15 March and 31 August. For areas where there is adequate biological information that birds are defending their established territories prior to 15 March, then earlier dates may be used as a starting time. Conversely, surveys should begin 1 April for the higher Cascades area where previous survey information has shown that birds return to their established territories later. Positive responses after 31 August are still valid, but negative results after this date do not count towards the number of visits required for completing the year's survey. Positive responses obtained only after 31 August also indicate that the area in question should be surveyed the following year.

ESTABLISHING THE SURVEY AREA

- o Develop transects and/or calling points to cover all spotted owl habitat within the delineated survey area.
- o Establish calling stations and survey routes to achieve complete coverage of the area, preferably with coverage from more than 1 calling point. Calling stations should be spaced approximately 1/4 to 1/2 mile apart, depending on topography and background noise levels. Take advantage of prominent points within the survey area when establishing calling stations. If necessary to ensure complete coverage of the area, supplement the prominent points with intermediate calling stations.

Where known spotted owl activity **centers exist within** the survey area, survey areas may be adjusted to exclude **habitat** that would be within **earshot** of the **activity center**. However, consider the need to survey the known **activity center** for **current status**.

The intent **is to** obtain **complete** coverage of the area where owls will be able to **hear** the **surveyor** and the surveyor will be able to hear **the owl**.

- o For each visit, whether results are positive or negative, record **the** following **information** on a survey form:
 - 1) Brief description of survey route.
 - 2) Survey start and stop time (total **amount** of time spent calling) and **total time** of survey.
 - 3) **Weather** conditions (including estimated wind **conditions** and precipitation).
 - 4) **Survey** results: note all **spotted** owl detections, including **sex** and age if possible, **time** of response and type of location (e.g. **audio**, visual, or both). For multiple or moving **owls**, **list** information and number each response or observation. This will allow more accurate **determinations** of **management** centers.
- o It is recommended that all **sightings** of, or responses by, barred owls, great horned owls, northern goshawks, or any other **raptor** species be **recorded**. The presence of barred owls, **great horned owls**, and goshawks may affect spotted owl responses.
- o For each **visit**, **regardless** of survey **results**, **map** (preferably on a USGS topographic, **aerophoto**, or some other high quality map), the following:
 - 1) Route surveyed and stations called; and
 - 2) All **spotted** owl response or observation locations. For multiple or moving **owls**, map all response or **observation locations** and number to correspond **with** survey **results**. Again, this **will** assist in determining activity centers.

It is **recommended** that barred owl, **great** horned owl, and **northern** goshawk responses or **observation** locations be mapped.

SURVEY METHODS

Two types of surveys are accepted: spot calling and leapfrog **calling**. Each is described below. Spot **calling** is **the** recommended **method**. Whatever method you use, be sure you cover all spotted owl habitat within the survey area.

- 1) **Spot calling:** Set up a series of calling points 1/4 to 1/2 mile apart along the road **transects**. When possible, pick **prominent** points which cover large areas. Spend at least 10 minutes at each **point**. Spend more time if the **topography** prevents you from hearing birds that **might** respond from the previous calling point (e.g. you cross a major ridge). If the topography **lends itself** to fewer, **prominent** calling **points**, spend more time at each point. Be sure the entire **survey** area is adequately covered.

- 2) Continuous walking or leapfrog surveys: Walk the designated route playing the tape and pausing at prominent points and at regular intervals throughout the area to **conduct** informal **stations** of **10-minute duration**. If two people are involved, you may use a leapfrog method (See Forsman 1983 - Methods and Materials for Locating and Studying Spotted Owls, USFS Gen. Tech. Rept. PNW-162).

The following **instructions** should **be** followed using either method:

- o It is recommended that a surveyor **use** a cassette tape with recorded **spotted owl** calls, a tape player, and a sound amplification device (**e.g.** a hand-held megaphone or loudspeaker). The use of a cassette tape, **tape** player, and sound **amplification device** enables surveyors to assure consistent and **equitable** calling **methods**. The amplified sound must be heard at least 1/4 mile. Surveyors must be stationed outside their vehicle. CAUTION: In areas of high owl density (**e.g.**, California **coastal** area), over-amplification may confound survey results by eliciting responses from spotted owls representing multiple **territories**.
- o Start the **tape** and let it run for 3-7 **calls**, **listen** for a **minute** or two, then play another set of calls. **It is recommended** that the **owl tape** contain calls from **both** male and **female** owls. In particular, it should include male 4-note contact **calls**, and male and female **agitated** calls.
- o Continue this process for at **least 10** minutes at *each* calling **station**.
- o Voice calling may be used by experienced surveyors at the discretion of the project leader (see **SURVEYOR CREDENTIALS/QUALIFICATIONS**). **Negative** results from inexperienced voice callers may not be adequate for evaluating spotted owl **presence/absence**.
- o Characterize behavioral observations as **best** you can. Make note of **agitated** calls, continuous responses, movement (toward you or away from you), or **situations** such as when one response is received and the owl is quiet thereafter. Recording **this** type of information may assist **with** the **identification** of activity centers.
- o **Conduct night** surveys between **sunset** and **sunrise**. Be sure not to call the same section of a survey **route** at the same time on *each* survey effort (i.e., **vary time** you start and the section of the route from which you start).
- o Do not survey under inclement weather conditions, such as high winds (> 10 mph), rain, heavy **fog**, or high noise levels (**stream** noise, machinery, etc.) which would prevent you from hearing response. If **weather** conditions or noise levels are in doubt, be conservative. Survey visits conducted under marginal conditions will reduce **quality** of the overall survey effort. **Negative results** collected under inclement weather conditions may not be adequate for evaluating spotted owl presence/absence.
- o Systematically survey spotted owl habitat within each **planning** or **activity** area (as defined above in **SURVEY AREA**) until an owl responds, or if no response is heard, until a **minimum** of **3** complete night visits are conducted each year for a 2-year period or a **minimum** of **6** complete night visits are conducted For a 1-year period.

- The objective of a complete visit is to conduct a **thorough** survey of the **entire** area in one field outing; however, in some cases this may **not** be possible. A **complete** visit may be a combination of a day and a night field outing and, in addition, may include a daytime follow-up visit. If reasonable **effort** was made to cover the area (**timber sale** or planning) in one outing, but this was not accomplished, then the remaining **unsurveyed** area should be surveyed in the following **field effort**. To reduce the chance of owls moving between **portions of the survey area** and, as a result, **being missed**, complete the visit on consecutive days **as much as possible**. The entire area should be **covered** within 7 days in order to be considered as one complete visit.
 - If the **project area** is too large to be surveyed in 7 days, it should be divided into **smaller** areas **based** on available habitat, topography, drainages, and other important **factors**. **Survey** areas need to be **small** enough to be **completely** surveyed **within** the specified **time period**.
 - If a surveyor gets an owl response at night and **conducts a daytime** follow-up, the **combination** of the night outing and the **daytime** follow-up would be counted **as 1** complete visit for that owl or pair of **owls**. If a surveyor goes out **at night** and **does not** get a response, a **daytime** follow-up would **not** be necessary. In **this** case, the night **outing alone** would be considered as 1 complete visit. **Whether** or not owls **are heard**, the **entire** area needs to be surveyed to count as a complete visit.
 - **Visits** must be spaced at least 5 days apart. For **example**, assume a visit **ends on the** 3rd of May. Using a proper five-day spacing (**4-8 May**), the next possible visit date would be 9 May.
 - At least 2 of the night **visits** per year must be conducted before 30 June for a 2-year survey and at least 4 of the night **visits** must be conducted before 30 June for a 1-year survey. To **ensure** the best coverage, at least 1 visit should be conducted in June. Survey **effort** should be spread out over 2-3 months, to avoid survey efforts **concentrated** in a short period of time, particularly at the beginning of the survey season. **Concentrating** visits **early** in the season may result in inaccurate assessments of nesting **status**; therefore such surveys may not be adequate for evaluating **spotted owl presence/absence**.
 - Where **survey seasons are restricted** (due to snow, landslides, mud, bridge failures, etc.), the survey period may be adjusted to fit the conditions. Documentation should be provided to explain the modified **survey period**.
 - Surveys may be **conducted during** the day where there are no roads or foot trails to traverse at night, or where there are other safety concerns. Documentation should be provided for specific safety concerns, etc.
- o If birds are heard during a survey:
- Estimate the bird's original **and final location**. One method is to **triangulate** on the owl's call, taking **compass** bearings from 2-3 locations. Make sure compass bearings are taken in as **short** a time-frame as

possible. Record on the survey form the method used to estimate the location.

- Record the location(s) of the owl, preferably on a map or photo attached to the survey form.

The intent of the triangulation and mapping is to provide a means for verification of the location. Attempt to confirm the owl(s) with a daytime follow-up. Daytime locations are very important in determining more precise management (activity) centers.

- o When a bird responds, record the required data. If no response is heard, proceed to the next calling point. Continue until the survey area is completely covered.
- o If a bird(s) responds at night, return to the area during the day as soon as possible (daytime follow-up) to verify status as described below, unless status has already been determined.
 - The objective of the daytime follow-up is to locate spotted owls (pairs or singles) by conducting an intensive search within the general vicinity (approximately a 0.5-mile radius) of the original response location at night. Surveys may begin from roads closest to the night response area. However, if owls do not respond to road surveys, surveyors should conduct walking routes through the area. Surveyors should spend sufficient time within the stand to cover the area well. This may take several hours, depending on the terrain. Observers should watch for owls flying in without responding and other evidence of occupancy, such as pellets, whitewash, and molted feathers. Pellets, whitewash, or feathers alone are not sufficient to document spotted owl presence or residency. Mobbing jays are also a potential indicator of owl presence. The follow-up should be completed as soon as possible after presence was detected, as owls are more apt to be located near the previous night's location. A daytime follow-up is only the second part of a complete visit.
- o If a response occurs during daylight hours and there is sufficient time to determine the status, do so.

DO NOT HOOT ANY MORE THAN IS NECESSARY. BY STIMULATING THE OWLS TO MOVE AROUND, YOU MAY INCREASE THEIR RISK OF PREDATION.

EXCESSIVE CALLING NEAR A NEST SITE MAY CAUSE HARASSMENT BY BRINGING THE FEMALE OFF THE NEST. EXCESSIVE USE OF THE AGITATED CALL IN HIGH OWL DENSITY AREAS (E.G., CALIFORNIA COASTAL AREAS) MAY ALSO CONFOUND SURVEY RESULTS BY ELICITING RESPONSES FROM OWLS REPRESENTING MULTIPLE TERRITORIES.

USE CONSERVATIVE JUDGEMENT AND HOOT ONLY AS MUCH AS IS NEEDED TO DETERMINE STATUS.

- o Once a bird responds at night, complete the station to determine pair status and the remainder of the survey route. To avoid 'leading' a spotted owl through calling, we recommend that once an owl responds, the surveyor go to the other end of the survey route and complete the rest of the survey. If that is not practical, survey only the remaining points that are beyond the earshot of the

responding bird. Beyond earshot is generally over a ridge or **at** least 1/2 to 3/4 mile straight-line **distance** from the owl. **Completing** the route will provide an **opportunity** to detect any other owls.

- o Continue to call for the duration of the scacion **visit** even after other species respond **unless** the surveyor believes chat this will Increase **the** potential for **predation** by great homed owls or goshawks, for example.
- o If a single bird responds, and **after** 3 complete **visits** (2-year survey) **or** 6 complete visits (**1-year** survey) resident status **has** not been determined, **then** up to 3 additional visits may be **necessary** in that year. Additional visits are visits conducted beyond the number of complete visits required by the 2- or 1-year survey protocol and **are** conducted only in **the general** area of the response (a 0.5-mile radius around **the site**). If **resident** status is determined at any point during **the additional visits**, no more visits to that **particular** site are required that year. **Other** portions of the project activity area may require further surveys.
- o **For** additional visits, maintain **the** standards (timing, intervals, weather **condition** **limitations, etc.**) outlined elsewhere **in this** document.

- 2-year survey .

In a 2-year survey, **the additional** visits are ro be conducted **the** same year as **the** response-

If the last response occurs on:

visit #1, conduct 1 additional visit
visit #2, conduct 2 additional **visits**
visit #3, conduct 3 **additional** visits

OR

until resident **status** is determined.

- 1-year survey

If the last response occurs on:

visit #4, conduct 1 additional visit
visit #5, conduct 2 additional **visits**
visit #6, conduct: 3 additional visits

OR

until resident **status** is determined

If 3 responses are not obtained, even after the additional visits, **then** the bird is not classified as a **resident** single.

STATUS

- o **Verify the** status according to the following **definitions** (**status visits** can be day or night). These definitions may be somewhat different from **the** stacus definitions outlined in the **density/demography** survey guidelines due to the **different** objectives of the guidelines for surveying proposed managemenc **activities**.

PAIR STATUS is established by any of the following:

- 1) a male and female are heard and/or observed (either initially or through their movement) in proximity (< 1/4 mile apart) to each other on the same visit; or
 - 2) a male takes a mouse to a female (see "mousing" clarification under GUIDELINES FOR DETERMINING REPRODUCTIVE STATUS); or
 - 3) a female is detected (seen) on a nest; or
 - 4) one or both adults are observed with young. Young alone do not define a pair because young barred owls look like young spotted owls until late in the summer.
- o When unidentified calls are heard in the vicinity of a known spotted owl do not assume species identification of the unknown owl. Dzytime follow-ups should be used to clarify these situations.

RESIDENT SINGLE STATUS is established by:

- 1) the presence or response of a single owl within the same general area on 3 or more occasions within a breeding season, with no response by an owl of the opposite sex after a complete survey; or
 - 2) Multiple responses over several years (i.e., 2 responses in year 1 and 1 response in year 2, from the same general area).
- o A resident single may represent a succession of single owls within the same general area in a single or multiple years.

Determining if the responses occur within the same general area should be based on topography and the location of any other owls known for the surrounding area. This should be determined by the wildlife biologist for the particular area. Radio-telemetry and banding data can also be used to aid in determining status of singles.

TWO BIRDS, PAIR STATUS UNKNOWN is established by:

- The presence or response of 2 birds of the opposite sex where pair status cannot be determined and where at least 1 member must meet the resident single requirements.

STATUS UNKNOWN is established by:

- The response of a male and/or female which does not meet any of the above category definitions.

PROTOCOL FOR DETERMINING REPRODUCTIVE STATUS

REPRODUCTION SURVEYS

Determining reproductive success is not required to avoid "take", if breeding season restrictions are applied to all harvest activity in order to protect owl reproduction during any given year. Restrictions may be dropped if, according to the protocol, surveys reveal that owls are non-nesting or that no young were produced.

The following is the recommended protocol for determining reproductive status of *spotted owls*. The protocol is designed for management purposes and may not meet all research goals. Reproduction surveys may provide information on nest tree locations which provide the most accurate management (activity) center locations.

- o There are 2 stages of reproduction surveys: nesting status and reproductive success.

NESTING STATUS

- o Conduct nesting status surveys between 1 April and 1 June. The start date is based on nest initiation dates. If local data suggests a different date for nest initiation, adjust the start date accordingly. Young identified after 1 June would still confirm nesting.
- o Spread the surveys throughout the survey period. Do not conduct all nesting status surveys early in the breeding season.
- o Use a standard "mousing" procedure as described below to determine nesting status. However, DO NOT "MOUSE" BIRDS ANY MORE THAN IS NECESSARY TO DETERMINE NESTING STATUS. BY STIMULATING THEM TO MOVE AROUND DURING THE DAY, YOU MAY INCREASE THEIR RISK OF PREDATION. THE SAME GOES FOR HOOTING. EXCESSIVE CALLING NEAR A NEST SITE MAY CAUSE HARASSMENT AND ENDANGER EGGS OR YOUNG BY BRINGING THE FEMALE OFF THE NEST.

MOUSING

- o Locate 1 or both members of a pair during the day and offer them mice or other small prey items.
- o Once the owl(s) take prey, or are found with natural prey, record the 'fate' of each prey item (e.g., eaten, cached, given to female or young). The fate of the prey is used to classify nesting status.
- o If the owl eats the prey item, continue to offer additional prey items until the owl caches the prey, sits on it for an extended period of time (30-60 minutes), refuses to take additional prey, or carries the prey away. If the bird flies with the prey, follow and try to determine the final disposition of the prey. For more details on mousing procedures, see Forsman (1983) Methods and Materials for Locating and Studying Spotted Owls. USDA Forest Service, Gen. Tech Rept. PNW-162.

- o Field personnel should make a **concerted** effort to get the owl(s) to take mice. Be creative in placing a mouse where the owl can easily see and capture it and offer mice to the mate of an owl that has refused mice on that visit.

The site will be classified as nesting, non-nesting, or unknown nesting status based on your observations.

NESTING

The owls will be classified as nesting if any of the following conditions are observed.

Two observations, at least 1 week apart, are required to determine nesting status if the first observation occurs before 1 May. This is necessary because the owls may show signs of initiating nesting early in the season without actually laying eggs and their behavior could easily be mistaken for nesting behavior. After 1 May, a single observation is sufficient.

Nesting is confirmed if, on 2 visits before 1 May, or 1 visit after 1 May:

- 1) the female is detected (seen) on the nest; or
- 2) either member of a pair carries natural or observer-provided prey to the nest; or
- 3) a female possesses a brood patch when examined in hand during mid-April to mid-June. Only 1 observation is required. Dates may vary with the particular areas. Be careful not to confuse the normal small area of bare skin (apteria) on the abdomen with the much larger brood patch. A fully developed brood patch covers most of the lower abdomen, extending to the base of the wings. Describe the brood patch on the field form, including length, width, color, and texture of the skin, and any evidence of regenerating feathers around the edge (NOTE - while a scientific research permit is not required by the Service for calling spotted owl, any capture or handling of spotted owls does require such a permit); or
- 4) young are detected in the presence of 1 or both adults. Because young barred owls look like young spotted owls until late in the summer, young alone are not sufficient.

NON-NESTING

The site is classified as non-nesting if any of the following are observed. Again, except for brood patch information, 2 observations are required during the nest survey period, with at least 3 weeks separating these observations to ensure that late nesting attempts are not missed. The second observation should occur after 15 April. Because nesting attempts may fail before surveys are conducted, the non-nesting status includes owls that did not attempt to nest as well as those that have failed.

Non-nesting is inferred if:

- 1) the female is observed roosting for 60 minutes, particularly early in the season (1 April to 1 May). (Be aware that nesting females with large nestlings often roost outside the nest during warm weather. If in doubt, be sure to schedule 1 or more visits in mid-June to check for fledglings.);
- 2) the female does not possess a brood patch when examined in hand between mid-April and mid-June; or
- 3) you offer prey to 1 or both members of the pair and they cache the prey, sit with prey for an extended period of time (30-60 minutes), or refuse to take additional prey beyond the minimum of 2 prey items. To be considered a valid nesting survey, an owl must take at least 2 prey items.

Surveys where the bird(s) leaves the area with prey and you are unable to determine the fate of the prey cannot be classified as to nesting status and do not count toward the required 2 visits. Banded or radio-marked birds may be reluctant to take prey at all; therefore, nesting status should be inferred from other means (e.g., checking for fledglings later in the season).

UNKNOWN NESTING STATUS

If nesting is not determined before 1 June, you CANNOT classify the owls as non-nesting using the criteria listed above.

- o If owls are found after 1 June, without young, nesting status is unknown.
- o If no owls are found after 1 June (at those sites where owls were present prior to 1 June), nesting status is unknown.

REPRODUCTIVE SUCCESS (NUMBER OF YOUNG FLEDGED)

Once a pair is classified as nesting, conduct reproductive success surveys after the time the young leave the nest (fledge), usually in late May to late June. If local fledging times are available you may adjust the dates accordingly.

Schedule at least 2 visits to the site to locate and count fledged young, timing the visits so that the fledged young are observed as soon after leaving the nest as possible to reduce losses to predation.

- o Attempt to locate fledged young. Use visual searches and/or mousing. If young are present, the adults should take at least some of the prey to the young. The sight of an adult with prey will usually stimulate the young to beg, revealing their number and location.
- o If the birds take at least 2 prey items and eventually cache, sit with, or refuse further prey without ever taking prey to fledged young; on at least 2 occasions, separated by at least 1 week, 0 young are recorded.

If you wish to determine **the true number** of fledged **young**, do the following:

- o On **the** first reproductive success **visit**, **count** the number of fledged young seen or heard.
- o Conduct a minimum of 1 follow-up visit, 3 to 10 days after **the first** fledged young is seen. This is necessary **because** it is possible **to** miss some **owlets** on a single **visit**.
- o If you do not **elicit** a response on a minimum of 2 visits, separated by at **least** 1 week during the **fledging** period. **then classify** the production of young as **unknown**.
- o If you **count young** on 1 **visit** but do not **get** back for a second **visit**, or find no owls on **the** second visit, **classify the number** of young **as** 1+ or 2+ ecc.

Opportunistic mousing late in the **season (after July 30)** may be **useful** for **providing** supplemental **information** about site **productivity**. However, mousing efforts late in **the** season must be considered **inconclusive** if **they** fail **to** provide positive Information, because dispersal and/or mortality may have occurred.

SPOTTED OWL SURVEYOR CREDENTIALS/QUALIFICATIONS

7 March 1991

REVISED - March 17, 1992

RECOMMENDATIONS FOR SPOTTED OWL SURVEYOR CREDENTIALS/QUALIFICATIONS

Surveyor qualifications are provided as recommendations for **evaluation** of personnel that would be involved in spotted owl surveys. These recommendations are advisory.

Project Leader:

Responsibility: Analyzes, draws conclusions from data, writes **survey reports**. Typically the Resource Area, District Biologist or **Forest** Biologist (Forest Service and BLM) or the Principal Investigator (**University, Contractor, etc.**) performs **this function**.

Minimum requirements:

- o A bachelor's degree in wildlife biology or **related** field; **Certified Wildlife Biologist** (by The Wildlife Society); or **meets** OPM Wildlife Biologist requirements, **AND**
 - one **year/season** of spotted owl survey experience or **training** in spotted owl **survey** techniques.
 - OR —
- o Previous experience as a Project Leader as described above.

Crew Leader:

Responsibilities: Supervises survey **crew**, **data** collection, performs basic data **summary**, and **coordinates with** other surveyors. Additional responsibilities include supervision of: 1) survey route layout, and 2) determination of area coverage **requirements**.

Minimum requirements:

- o Normal hearing abilities are requisite. A crew **leader** must be able to hear the owl(s) if **they** were calling; **AND**
 - One **year/season** of spotted owl **survey** experience, plus **training** in spotted owl survey techniques; **OR**
 - Two **years/seasons** of spotted owl calling surveys.

Owl Caller or Surveyor:

Responsibility: conducts owl survey and collects data.

Minimum requirements:

- o Normal hearing abilities are **requisite**. An owl caller **must** be able to hear the owl(s) if they were calling; **AND**
 - Training in spotted owl **survey** techniques; **OR**
 - 1 **year/season** of spotted owl survey experience.